The Learning Accelerator

From Urgent to Future:
Charting a Course for AI in K-12 Education

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The Learning Accelerator:
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Key Takeaways

- AI is entering K-12 quickly, but most systems lack a clear, cohesive vision for how it might be used to reimagine teaching and learning, as well as the infrastructure needed to enact that vision.
- When aligned to strong pedagogy, AI can help redesign the instructional core to deepen engagement, personalize learning, and expand student opportunity at scale.
- Moving from experimentation to reimagination requires systems to invest in educator capacity, center co-design with communities, and align policy, infrastructure, and measurement to student-centered goals.

Introduction

Despite decades of development, the recent rise of generative AI has sparked urgent—and often uneven—activity across the K-12 education sector. Some schools and systems rushed to ban the technology entirely, citing concerns around safety, cheating, and misinformation. Others moved quickly to integrate it, often without a clear plan for how it should support teaching and learning. Most are experimenting cautiously, awaiting clearer direction from state and national leaders.[1]

However, the challenge goes beyond a lack of vision for this technology's instructional use. In fact, many education leaders are acting with clear values and ambitious, student-centered goals. State agencies are taking the opportunity to integrate AI into their work surrounding Portrait of a Graduate frameworks. Districts are linking AI to broader personalized learning and innovation strategies. **What is missing is not intent; it is alignment with what student-centered AI integration looks like in practice.**

So far, much of AI's use in education has reinforced the status quo: streamlining familiar routines, accelerating existing pacing structures, or managing compliance tasks. These uses may offer short-term efficiencies, but they risk embedding AI within outdated instructional models rather than using it to reimagine them.

This moment demands something bolder. **The opportunity before us is not to replicate the status quo more efficiently, but to rethink the instructional core: what students learn, how they learn it, and the systems that support them.** With care and clarity, AI can help educators focus on relationships and pedagogy, empower students to shape their learning journeys, and enable flexible models that support mastery, relevance, and collaboration.

This paper calls for the sector to leap forward—to move beyond cautious pilots and reactive policies toward a future where AI is used to profoundly reimagine teaching and learning to put humans at the center. To do that, education leaders and policymakers must confront a central question:

[1] Gross, B., Opalka, A., & Severn, L. (2024). *How Districts Are Responding to AI—and What It Means for the New School Year*. Center on Reinventing Public Education.

What policies need to exist for AI to fundamentally shift our shared instructional paradigm and ensure ALL students engage in powerful learning that drives durable outcomes at scale?

Answering this question will require more than technical guidance or new tools. It calls for rethinking how systems define success, share power, and design for change. This paper charts a path forward: connecting today's urgent decisions with a long-term vision for instruction grounded in deep learning, strong relationships, and expanded opportunity for every student.

A Future of Student-Centered, AI-Enabled Learning

Before defining policies, developing tools, or guiding implementation, the field needs a shared sense of purpose. *What, exactly, is the goal?* While AI guidance is emerging across the country, much of it focuses on managing risk or enabling experimentation within existing models.[2] What's missing is a clear and compelling vision for how AI can help education systems do something fundamentally different. This section outlines that vision, not as a prescription, but as a provocation, grounded in what is possible when AI is used to deepen learning, center students, and expand opportunity.

Across our work with educators, school systems, and researchers, five core shifts have emerged as essential to a more inclusive, responsive, and effective approach to AI integration in K-12 education:

- **Personalized learning** that supports relationships;
- **Mastery-based progression** that moves beyond seat time;
- **Flexible environments** that expand when, where, and how learning happens;
- **Access to meaningful learning** that reflects students' lived experiences; and,
- **Student agency** in setting goals, making choices, and reflecting on growth.

Each of these shifts represents a departure from traditional systems and assumptions. They are not about doing what we've always done more efficiently, but designing something fundamentally better. In the following sections, we explore each shift in more detail, showing what is possible when AI is aligned with strong pedagogy, inclusive values, and bold instructional (re-)design.

I. Personalized Learning at Scale

Personalized learning—meeting students where they are and connecting learning to their strengths, needs, interests, and identities—has long been a goal in education. For decades, educators have differentiated instruction,[3] built responsive classroom environments,[4] and designed experiences that reflect the full humanity of their students.[5] While technology has long promised to scale this vision, from early adaptive

[2] Gross, B., & Jochim, A. (2024). *How districts are responding to AI—and what it means for the new school year*. Center on Reinventing Public Education. https://crpe.org/study-how-districts-are-responding-to-ai-and-what-it-means-for-the-new-school-year
[3] Tomlinson, C. A. (2001). *How to Differentiate Instruction in Mixed-Ability Classrooms*. ASCD.
[4] Evertson, C. M., & Emmer, E. T. (2016). *Classroom Management for Middle and High School Teachers* (10th ed.). Pearson.
[5] Gay, G. (2010). *Culturally Responsive Teaching: Theory, Research, and Practice* (2nd ed.). Teachers College Press.

software[6] to 1:1 devices[7] and learning management systems,[8] these efforts often emphasized delivery over connection, reducing personalization to screen time instead of student-centered design. **What sets this moment apart is the potential to overcome persistent barriers to scale– limited time, capacity, and real-time insight– that have made sustained personalization difficult across classrooms and systems.[9]**

AI offers a new way forward, not by reinventing personalization, but by extending the strategies that work and making them more sustainable at scale. Approaches like formative assessment, flexible grouping, scaffolding, project-based learning, and culturally responsive pedagogy all rely on teacher expertise, strong relationships, and timely feedback, which are not new. A body of research indicates these practices improve outcomes, especially for students historically underserved by one-size-fits-all models.[10] AI can make them more sustainable.

When used thoughtfully, it can activate prior knowledge through dialogue, identify misconceptions, translate materials, and provide real-time feedback. By reducing the logistical burdens of differentiation, teachers can focus on rich dialogue, inquiry, and collaboration - the moments where human facilitation remains essential and irreplaceable. However, there's a risk of misinterpretation. AI-powered personalization is too often equated with students working alone through screen-based content. This reductive model erodes the relationships and cultural connections that make learning meaningful.

The opportunity is to pursue a different model, one where personalization is grounded in strong relationships and supported by timely insight. In this vision, AI helps educators know their students deeply and helps students feel seen, supported, and challenged, not in isolation, but as part of a learning community

Scaling Personalization, Not Screens at ASU Prep

ASU Preparatory Academy is scaling **Archie**, an AI-powered tool embedded in their online math platform, Digit, as part of The Learning Accelerator's (TLA) Accelerating Adoption Network. Archie delivers personalized, real-time feedback to help students better understand Algebra 1 concepts. Students use the tool to reflect on their progress and learning needs, with insights shared directly with teachers. This enables timely, targeted support while maintaining strong educator-student connections. Rather than replacing instruction, AI is used to deepen personalization, making responsive learning more sustainable and scalable across classrooms.

II. Mastery-Based and Competency-Aligned Progression

[6] Bulger, M. (2016). *Personalized Learning: The Conversations We're Not Having*. Data & Society.
[7] Walkington, C. (2013). *Using adaptive learning technologies to personalize instruction to student interests: The impact of relevant contexts on performance and learning outcomes*. *Journal of Educational Psychology, 105*(4), 932–945.
[8] Johnson, M., Adams Becker, S., Cummins, M., Estrada, V., Freeman, A., & Hall, C. (2016). *NMC Horizon Report: 2016 Higher Education Edition.* The New Media Consortium.
[9] Pane, J. F., Steiner, E. D., Baird, M. D., & Hamilton, L. S. (2015). *Continued Progress: Promising Evidence on Personalized Learning*. RAND Corporation.
[10] Pane, J. F., Steiner, E. D., Baird, M. D., Hamilton, L. S., & Pane, J. D. (2017). *Informing Progress: Insights on Personalized Learning Implementation and Effects*. RAND Corporation.

Mastery-based learning models ask students to demonstrate meaningful understanding and skill, advancing when they are ready, not when the calendar dictates. These models are often supported by frameworks like Portrait of a Graduate or locally developed competency maps, emphasizing deeper outcomes such as collaboration, problem-solving, and communication.[11]

Despite widespread interest, implementation at scale remains complex. Educators face challenges in consistently tracking individual progress, supporting flexible pacing, and assessing skills that don't always fit neatly into traditional grading systems.[12] AI can help address these barriers by making student progress more visible and actionable. From curating portfolios and surfacing patterns in student work to informing real-time instructional adjustments, AI can extend teachers' capacity to support student growth over time.

More importantly, AI may help educators recognize and value learning that has historically gone under measured. Tools illuminating students' approaches to inquiry, reflection, and problem-solving can provide a more complete picture of learning, not just what students know, but how they learn and grow.[13] This shift moves away from static measures toward dynamic, student-driven evidence of progress.[14]

This approach values demonstration over completion and invites multiple forms of feedback and iteration. When paired with thoughtful instructional design and supportive policy, AI can help ensure that mastery is not just a goal, but a visible, motivating part of students' learning experiences.

Designing for Mastery at Building 21

As part of the Exponential Learning Initiative, Building 21 is scaling two AI-powered tools to support mastery-based learning in English Language Arts. The first is an AI Project Builder that provides step-by-step guidance to help students design personalized projects aligned with specific competencies and performance levels. The second is an AI Feedback Tool, embedded in the Beacon platform, which delivers immediate, actionable feedback on student work to guide revisions and skill development. Together, these tools aim to make the learning process more transparent, iterative, and student-driven, helping educators and learners focus on growth, reflection, and performance rather than time or task completion.

III. Flexible, Community-Integrated Learning Environments

Traditional school structures (e.g., fixed schedules, physical classrooms, time-based pacing) often constrain how, when, and where learning can happen.[15] These systems rarely reflect the complexity of students' lives or the range of spaces where learning is possible. AI presents an opportunity to design learning

[11] Patrick, S., Worthen, M., Frost, D., & Truong, N. (2018). *Current to Future State: Issues and Action Steps for State Policy to Support Personalized, Competency-Based Learning*. iNACOL (now Aurora Institute).
[12] Bailey, J., Phillips, K., Schneider, C., Sturgis, C., & Vander Ark, T. (2013). *From Cohorts to Competency: The District of Columbia Public Schools' Shift to Competency-Based Learning*. Digital Learning Now!, Foundation for Excellence in Education.
[13] Soland, J., Hamilton, L. S., & Stecher, B. M. (2013). *Measuring 21st Century Competencies: Guidance for Educators*. RAND Corporation.
[14] Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). *Intelligence Unleashed: An Argument for AI in Education*. Pearson.
[15] Mehta, J., & Fine, S. (2019). *In Search of Deeper Learning: The Quest to Remake the American High School*. Harvard University Press.

environments that are more flexible, connected, and responsive, supporting movement between in-person, virtual, independent, and community-based experiences.

AI can help educators create and manage learning pathways that extend beyond the classroom by reducing logistical burdens, such as scheduling, translation, and formative feedback.[16] Students might spend part of their day engaged in small-group instruction, part working independently on a project, and part learning in the community, guided by a trusted adult and supported by AI-powered coordination tools. In this way, AI can serve as connective tissue across diverse settings, helping students navigate time, space, and support systems more fluidly.

This type of learning design is demanding. It requires new instructional models, strong relationships, and infrastructure that can flex with students' needs.[17] Further, teachers must manage interdisciplinary projects, shifting schedules, and the need for real-time adjustments. **AI can assist with pieces of this work, but it cannot replace the vision, care, and collaboration required to build powerful environments for learning.**

The role of AI in these settings is best understood as a scaffolding mechanism, helping to manage complexity, surface insights, and streamline coordination without displacing the human elements at the core of meaningful education.[18] As more schools explore hybrid, place-based, and community-integrated learning, AI can help make these models more sustainable—but only as part of a broader system that prioritizes access, trust, and instructional depth.

Coordinating Across Communities at Da Vinci Connect

At Da Vinci Connect TK-8, a public hybrid homeschool model in California and one of the Accelerating Evidence sites for TLA's Exponential Learning Initiative, students engage in a blend of in-person instruction, independent work at home, and interdisciplinary, project-based learning. Families play an active role, partnering with educators to support learning across contexts. This model expands where and how learning happens, but it also introduces real complexity. Teachers must coordinate shifting schedules, adapt projects to individual students, and ensure continuity across learning spaces. While Da Vinci Connect is not yet extensively leveraging AI tools, the model illustrates how a learning environment can seamlessly integrate across communities to build collaborative, project-based learning experiences for students. With careful and thoughtful integration, AI-powered scaffolding could support communication, coordination, and instructional responsiveness without replacing the human relationships at the heart of deep learning.

IV. Access to Deep, Relevant Knowledge-Building

Students need more than access to information; they need learning experiences that help them make sense of the world, build lasting understanding, and apply knowledge in meaningful ways. Decades of

[16] Means, B., & Neisler, J. (2021). *Lessons from Remote Learning During COVID-19: Implications for the Future of Learning*. Digital Promise.
[17] Hamilton, L. S., Grant, D., Kaufman, J. H., & Diliberti, M. (2021). *Remote Learning Is Here to Stay: Results from the First American School District Panel Survey*. RAND Corporation.
[18] Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). *Intelligence Unleashed: An Argument for AI in Education*. Pearson.

research affirms that deeper learning happens when students can connect new ideas to prior experiences, engage with complex questions, and collaborate with others to construct meaning.[19] These experiences foster not just academic knowledge, but curiosity, reflection, and the ability to transfer learning across contexts.

AI has the potential to support this kind of learning, but only when systems are designed with these goals in mind. When used intentionally, AI tools can help educators differentiate content aligned to students' interests and identities, scaffold inquiry into complex topics, and curate rich, diverse learning materials. AI can surface texts that reflect multiple perspectives, pose generative questions, and support students in revising and synthesizing ideas. In the hands of learners, these tools can extend reflection and sense-making, helping students construct knowledge, not just consume it.[20]

However, these possibilities come with real and persistent risks. AI tools are not developed in neutral environments—they are trained on datasets that reflect dominant perspectives and built within systems that often marginalize non-dominant voices.[21] As a result, they are more likely to reinforce limited narratives than reflect the full breadth of student experience. When students engage with outputs from these systems without guidance or critique, the result is often a form of surface-level learning, consuming information without questioning its source, context, or significance. Instead of supporting meaning-making, these tools can encourage passive absorption of incomplete or biased content, undermining the reflection, curiosity, and connection that deep learning demands. Without deliberate efforts to interrogate and redesign these systems, AI is more likely to reproduce narrow views of knowledge, not because of a technical flaw, but because of the assumptions and omissions embedded in its creation.

Addressing these risks requires more than optimistic assumptions about future improvements, it demands intentional action. Building systems supporting meaningful knowledge-building requires reshaping how tools are developed, adopted, and used in classrooms; investing in professional learning that helps educators use AI to enrich instruction; demanding that developers create inclusive, multilingual, and community-relevant tools; and ensuring that ALL students have the infrastructure, devices, and support to engage critically and meaningfully, no matter where they live or attend school.

The central question is *what kind of learning AI should support and for whom.* The path forward starts with grounding technology decisions in the learning experiences we want every student to have: rigorous, reflective, relevant, and rooted in connection.

Supporting Student Learning with Coursemojo

Coursemojo, a participant in TLA's Accelerating Adoption Network, is a curriculum-aligned, AI-powered platform that transforms grade-level reading and writing tasks to be highly-interactive and differentiated. Students receive real-time feedback on their responses and "just right" scaffolded questions to push them toward deeper understanding. Mojo also

[19] Darling-Hammond, L., Flook, L., Cook-Harvey, C., Barron, B., & Osher, D. (2019). *Implications for educational practice of the science of learning and development*. Applied Developmental Science, 24(2), 97–140.
[20] Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). *Intelligence Unleashed: An Argument for AI in Education.* Pearson.
[21] Baker, R. S., & Hawn, A. (2021). *Algorithmic Bias in Education. International Journal of Artificial Intelligence in Education, 31*, 887–902.

supports teacher effectiveness by providing a live dashboard showing every student's level of understanding, highlighting students who need extra support, surfacing trends in student misconception, suggesting discussion questions, and celebrating exemplary work. These supports for both students and teachers support meaning-making, helping students connect ideas, refine their thinking, and invest effort and intentionality in their learning. By centering inquiry and reflection, the tool extends instructional dialogue and fosters habits essential for deep, transferable learning.

V. Student Agency and Voice in Learning Pathways

Students learn best when they own their learning, can set meaningful goals,[22] reflect on progress, and choose how to engage.[23] **Agency is more than autonomy; it is the ability to act purposefully, supported by the relationships, structures, and systems that make meaningful decision-making possible.**

AI has the potential to support student agency, but only when it is used to scaffold, not replace, the reflective processes that drive learning. Well-designed tools and practices can help students clarify their goals, identify resources, track progress, and receive feedback that supports iteration. In this role, AI functions as a co-pilot that elevates student thinking, supports metacognition, and surfaces insights that deepen engagement.[24] It should amplify student voice, not override it.

In our research with virtual and hybrid learning models, students routinely emphasized the importance of human connection.[25] In their experience, agency was not about working alone; it was about being seen, supported, and given space to drive their learning in partnership with caring adults. AI can strengthen these dynamics when thoughtfully integrated, but it cannot substitute for trust, dialogue, or guidance. To support student agency at scale, instead of AI-powered tools, schools and systems need learning models that make time for goal-setting and reflection, schedules that support iteration and revision, and adult roles that shift from delivery to mentorship. Without these conditions, AI may reinforce shallow self-pacing models rather than support meaningful, student-driven growth.

Empowering Learners with SPARK

The SPARK framework, developed by Dr. Sabba Quidwai, guides learners and educators through a thinking routine to identify problems, craft narrative, and apply a design-thinking approach when using AI tools like ChatGPT. Instead of giving students the questions to ask, the framework asks them to describe the Situation; identify the Problem; articulate their Aspiration, define measurable Results, and share Kismet or surprise. SPARK gives students a practical tool to drive their own learning. They then have *agency* in choosing how and when to use AI to generate ideas, ask deeper questions, gather feedback, and iterate on their work—all in service

[22] American Institutes for Research. (2016). *Student Goal Setting: An Evidence-Based Practice*. Washington, DC: AIR.
[23] Schunk, D. H., & Greene, J. A. (2017). Self-regulated learning and performance: An introduction and an overview. In D. H. Schunk & J. A. Greene (Eds.), *Handbook of self-regulation of learning and performance* (2nd ed., pp. 1–15). Routledge.
[24] Holmes, W., Bialik, M., & Fadel, C. (2019). *Artificial Intelligence in Education: Promises and Implications for Teaching and Learning.*
[25] The Learning Accelerator. (2023). *Student engagement in virtual and hybrid learning: Research insights and strategies for practitioners*.

of goals they've defined for themselves. Rather than replacing student thinking, the AI acts as a thought partner, helping learners engage more purposefully and build confidence in their voice. This framework demonstrates how agency is not about working alone, it is about having the support and tools to lead learning with clarity and intention.

What's Holding Us Back

The previous section outlined a future in which AI expands what's possible for students, personalizing learning, supporting mastery, creating more flexible environments, building deeper knowledge, and strengthening student agency. ***If that's the vision, what stands in the way of realizing it?***

We conducted a national landscape review to answer that question—interviewing three state education agency (SEA) leaders, four local education agency (LEA) leaders, and three national experts in K–12 and AI; analyzing guidance documents from 27 SEAs; reviewing 30 LEA AI policies and implementation plans; and studying leading reports and resources across the sector. This research was further informed by our direct partnerships with 19 school-based teams through the School Teams AI Collaborative, a national initiative co-led with Leading Educators in which educators are actively exploring AI integration into classroom practice. We also worked alongside three of our grantees in the Accelerating Adoption Network, part of our Exponential Learning Initiative, to examine how innovative school models apply AI to advance student learning.

This disconnect between the promise and reality of AI is not simply a matter of coordination—it reflects deeper structural challenges that must be addressed to move from experimentation to transformation. To build toward a more student-centered, AI-enabled future, education systems must first confront the foundational conditions shaping AI's adoption today. Across our work, four persistent barriers have emerged:

I. **Policy gaps** rooted in legacy systems rather than innovative models;
II. **Implementation challenges** that make it hard to sustain and scale what works;
III. **Outdated measurement systems** that limit how learning is defined and understood; and,
IV. **Structural inequities** that risk deepening existing disparities.

In the sections that follow, we examine each of these barriers in more detail, identifying how they show up in the field, why they matter, and what it will take to address them in service of powerful, student-centered learning.

I. Policy Gaps Rooted in the Status Quo

In our landscape review of SEA AI guidance documents, all 27 reference student data protection, 22 address ethical use, and many include broad alignment to instructional goals such as graduate profiles or personalized learning frameworks. These are critical foundations—guardrails that help ensure safety, privacy, and responsible use. **However, across the documents, policy seldom moves beyond these initial steps to actively shape how AI might support more ambitious instructional change.**

In contrast, LEAs tend to focus primarily on classroom-level AI integration. Among the 30 LEAs whose documents we reviewed, 26 emphasize responsible and ethical AI use as a guiding principle, 15 describe specific instructional applications of AI, and 14 highlight student agency or personalized learning. Notably, even when instructional uses are specified, such as drafting formative feedback, generating lesson materials, or differentiating instruction, they are generally framed within existing teaching models and accountability systems. While this instructional focus is essential, it is often limited by traditional assumptions about time, mastery, and the roles of teachers and students.

Together, these policies reflect meaningful early action and a need for clearer signals that encourage innovation. **Most guidance treats AI as a support for what already exists, rather than as a lever to evolve instructional systems.** Too often, foundational components like pacing guides, grading policies, and seat-time requirements remain untouched, even though they directly limit the kinds of learning AI could help unlock.

If policy remains anchored in traditional frameworks, the systems built today may ultimately reproduce the limitations they aim to solve. Unlocking AI's full potential will require moving beyond risk management and towards policies that connect safety, purpose, and the conditions that enable deeper, student-driven learning.

II. Implementation Challenges Prevent Localized Success from Scaling

Across the country, educators, schools, and systems are already exploring how generative AI might support student learning. These early-stage efforts reflect creativity, commitment, and a growing desire to align AI use with core instructional goals. Innovations are emerging that center student agency, formative feedback, and collaborative planning. These efforts show real promise, and they demonstrate what's possible when educators are given the time and space to lead.

Still, most of this work remains localized. Promising practices developed in one classroom or school often face barriers to spreading or sustaining beyond the pilot phase. Across our research and partnerships, three structural conditions have consistently shaped whether early innovation can take root and scale.

1. An AI Marketplace Misaligned with Instruction

Educators are navigating a rapidly expanding edtech landscape where many AI tools are designed for productivity—automating tasks, summarizing content, or simulating interactions—rather than deepening learning or supporting student thinking. While these tools can offer value, few are built around the instructional strategies educators know drive lasting learning, such as discourse, inquiry, and metacognitive reflection.

Without a strong instructional vision to guide selection and use, schools and systems risk defaulting to tools that reinforce surface-level engagement rather than transformative practice. As Dan Greene notes, tools developed outside of schools and without community input often reflect commercial incentives that prioritize what can be easily measured—efficiency, correctness, completion—over the more complex, relational, and reflective work of teaching and learning. Without clear alignment between tools and learning

goals, even well-intentioned implementation can unintentionally sideline student identity, voice, and critical thinking.[26]

2. Systems Lack the Infrastructure to Support Learning at Scale

Even the best tools require support. As AI enters classrooms, educators are asked to make complex decisions about which tools to use, how to use them responsibly, and how to align them with their students' needs. However, few districts have the professional learning infrastructure to meet these demands.

Research from the Research Partnership for Professional Learning (RPPL) highlights the need for professional learning *about* AI, covering ethics, equity, and technical understanding, and professional learning *with* AI, giving educators time and space to test, reflect, and improve their practice. In many systems, however, time for collaboration is limited, coaching is not structured around emerging practices, and innovation is layered on top of already stretched professional development models.

3. Innovation Occurs in Isolation

Across the field, powerful innovations are emerging from classrooms, schools, and educator teams. These efforts reflect deep expertise and local vision, yet they often remain disconnected from broader system structures—unable to spread, sustain, or influence strategic planning beyond the spaces where they began.

This is not a design failure. It reflects longstanding system conditions: fragmented decision-making, siloed roles, and limited knowledge-sharing time. Without mechanisms to support cross-team collaboration, shared learning, and alignment with district-wide goals, innovation often remains a pilot rather than a pathway to broader change. **If AI is to be a catalyst for instructional improvement, the field must focus not only on what works in classrooms but also on the conditions that allow promising practices to spread.** That means ensuring tools align with strong pedagogy, investing in meaningful professional learning, and designing systems where educator-led experimentation is not the exception, but the foundation for change.

III. Measurement Systems Prevent Knowing What's Working, Why, or for Whom

As generative AI tools enter classrooms, schools and systems struggle to evaluate their true impact. Existing measurement systems designed to assess time-bound performance on standardized tests are poorly suited to capture the iterative learning, real-time feedback, student agency, or instructional shifts empowered by AI. As a result, schools face mounting pressure to adopt new tools without clear ways to determine whether they are meaningfully improving teaching and learning.

In our research and focus groups with SEA and LEA leaders, three questions surfaced repeatedly:

[26] [1] Greene, D. (2023, May 3). *Teaching AI without talking about power misses the point*. Chalkdust & Silicon.

1. *How do we know if AI is improving learning, not just saving time?*
2. *How do we measure progress in personalized, nonlinear pathways*? and
3. *How do we evaluate AI use without defaulting to outdated compliance metrics?*

Despite growing interest in outcomes like student agency, creativity, and engagement, few systems have built measurement strategies that reflect these goals. AI has the potential to support this shift by generating multimodal data, supporting formative assessment, and surfacing patterns across classrooms—but only if measurement is designed with purpose and aligned to instructional values. Without new frameworks, tools, and infrastructure, there's a risk that AI-enabled practices will be scaled without understanding their actual impact—or worse, that traditional models will simply be retrofitted with new tools to speed up grading or automate lesson planning while leaving core issues like rigid pacing guides, seat-time requirements, or shallow assessments untouched.

IV. Structural Inequities May Be Worsened by AI

AI is entering education within systems already shaped by inequity. From development to deployment, AI tools reflect the values, assumptions, and blind spots of the environments in which they're created. These tools often replicate and amplify existing injustices—a phenomenon Ruha Benjamin (2019) calls the "New Jim Code," where seemingly neutral technologies reinforce structural racism. When trained on narrow datasets or built without diverse input, these systems risk reinforcing dominant cultural narratives and overlooking the needs of many learners.[27]

In education, this plays out in multiple ways. AI tools have misinterpreted student language, reinforced stereotypes, and disproportionately penalized students of color, English Learners, and female students, especially when used for surveillance or automated feedback.[28] These patterns have been documented across systems and settings, with researchers like Safiya Noble (2018) demonstrating how algorithmic tools often reproduce racism and reinforce dominant ideologies under the guise of neutrality.[29] Often proprietary and opaque, these systems leave educators little insight into how decisions are made or how bias might be addressed.

Access to meaningful AI use is also uneven. In well-resourced schools, educators have time and support to explore creative uses of AI. In under-resourced schools, AI is more likely to be introduced through compliance-oriented tools or without professional learning, reinforcing the same digital divides that have long limited opportunity.[30] These disparities are not new. However, given the speed and scale at which AI is being adopted, the urgent need to make justice a central design principle cannot be an afterthought. As Yong Zhao (2017) reminds us, even well-intentioned reforms can carry unintended side effects when technologies are deployed without critical interrogation.[31] **Students, families, and educators need to be involved in decisions about AI,** demanding transparency and accountability from developers, and

[27] Benjamin, R. (2019). *Race after technology: Abolitionist tools for the new Jim code*. Polity Press.
[28] Eubanks, V. (2018). *Automating inequality: How high-tech tools profile, police, and punish the poor*. St. Martin's Press.
[29] Noble, S. U. (2018). Algorithms of oppression: How search engines reinforce racism. NYU Press.
[30] Darling-Hammond, L., Zielezinski, M. B., & Goldman, S. (2020). *Designing for equity: Leveraging technology to empower learning for all students*. Learning Policy Institute.
[31] Zhao, Y. (2017). What works may hurt: Side effects in education. Teachers College Press.

evaluating success not just by overall outcomes, but by the quality of opportunity and experience for every learner.

Bridging the Gap

Education leaders must focus on system-level change to move from today's fragmented experimentation to a future where AI meaningfully supports deeper, student-centered learning. **This means creating the conditions for innovation to take root, not just in isolated classrooms, but across entire schools, districts, and states.** The following three shifts offer a roadmap for turning early promise into lasting impact, building the capacity, ownership, and policy coherence needed to enable real instructional transformation.

I. Build System-Wide Capacity and Coherence

When thoughtfully integrated, AI can help redesign instructional practices, support new learning models, and expand what's possible in the classroom. However, this potential is limited if tools are simply layered onto systems that were not built for flexibility, collaboration, or continuous improvement.
Realizing AI's promise requires coordinated investments in educator capacity, infrastructure, and measurement. Teachers and school leaders need time, collaboration, and professional learning to explore how AI connects to their instructional goals. Infrastructure must support meaningful use, not just access, by ensuring tools are interoperable, accessible, and aligned to local needs.

Just as critically, coherence depends on how success is defined and measured. Current accountability systems are often too narrow to capture the outcomes AI might support, such as student agency, metacognition, or collaborative problem-solving. Systems need broader, more meaningful approaches that:

- Reflect whole-child outcomes and long-term growth;
- Integrate into everyday instruction;
- Support real-time feedback for students and educators; and
- Generate insights into what works, for whom, and under what conditions.

This shift in measurement is essential not just for tracking impact but for reinforcing the deeper learning outcomes at the center of AI-enabled education. With stronger capacity and more coherent systems, schools can move beyond tool adoption toward more purposeful and sustainable instructional improvement.

Redefining What Counts as Evidence

Several virtual and hybrid schools within the Exponential Learning Initiative use expansive systems to measure student learning that range from standards progressions and course completion to workforce competencies and community-based projects. Models such as Bismarck Public Schools Empower[ED], Da Vinci Connect TK-8, and Novi Virtual are moving beyond a rigid focus predominantly on test scores to track engagement, agency, and growth

over time, surfacing deeper insights into how students learn and the conditions that support meaningful progress. Their work offers a model for how systems can rethink systems of evidence to reflect the full range of student experiences and outcomes.

II. Co-Design as a Core Strategy

If AI is to support more human-centered learning, its design and implementation must be shaped by the people most affected. Too often, decisions about AI use are made without meaningful input from educators, students, or communities, limiting both effectiveness and trust.

Co-design offers a more responsive and sustainable approach. When diverse stakeholders are engaged early and consistently, systems are more likely to identify relevant problems, surface creative solutions, and build shared ownership of the work ahead. This is especially critical in communities that have been historically excluded from educational decision-making or disproportionately impacted by surveillance-oriented technologies.

Embedding co-design into planning and implementation is not just good practice, it is essential for ensuring that AI advances, rather than undermines, the relationships, relevance, and agency at the heart of powerful learning. It helps shift AI from something done to schools to something built with them, aligning development with local priorities and values.

Bridging the Implementation Gap

At The Eliot K-8 Innovation School in Boston, educators used an AI-powered feedback tool to deepen student reflection and ownership in writing. Rather than letting AI replace teacher input, the team designed routines that helped students evaluate AI suggestions alongside peer and teacher feedback, strengthening critical thinking and revision. Through the School Teams AI Collaborative, the team addressed key implementation barriers, aligning tool use to strong pedagogy, engaging in sustained professional learning and coaching, and sharing practices across their school as well as the Collaborative network. While system-wide scale will require continued support, this work shows what's possible when educators are empowered and supported to lead AI integration.

III. Policy as a Lever for Instructional Improvement

Many current AI policies focus on managing risks, such as data privacy, safety, and ethical use. While these guardrails are essential, they are only the starting point. To unlock AI's full potential in education, policy must also be designed to enable innovation and support meaningful instructional change.
This means creating proactive policy systems, not just reactive ones. Strong policy sets a clear vision for learning, creates space for new models to emerge, and evolves alongside the tools and practices it seeks to guide. It asks:

- *What kind of learning do we want to make possible?*

- *What conditions are required to support it?* and
- *How will we know if we're making progress?*

Enabling policies do not prescribe specific tools—they foster the conditions that allow local systems to innovate purposefully. They align funding, infrastructure, professional learning, and accountability systems toward student growth, meaningful engagement, and readiness for the future. When policy is used not just to manage risk, but to build capacity and create alignment, it becomes a powerful lever for rethinking how schools support teaching and learning.

Guidance, Built on Policy & Aligned to Instructional Vision

Desert Sands Unified School District's (DSUSD) *Generative AI Guidance for Educators* offers a promising example of LEA-level leadership that connects AI use to broader instructional goals. Rather than creating new policy, DSUSD determined that existing technology policies sufficiently addressed safety and secure use. Instead, the district focused on developing guidance to close implementation gaps, clarifying how AI can be thoughtfully and effectively integrated into teaching and learning. By aligning guidance with the district's graduate profile and strategic plan, emphasizing professional learning and educator agency, and committing to ongoing reflection and refinement, DSUSD models how local approaches can support both responsible use and instructional innovation. The guidance invites purposeful experimentation grounded in trust, instructional alignment, and continuous improvement.

IV. Equity as a Core Design Principle

The K-12 education system has historically been marked by long-standing inequity, and the AI tools rapidly being integrated into it risk perpetuating existing bias. From discipline systems that disproportionately penalize students of color to learning environments that overlook culturally responsive content, inequity is embedded into the fabric of many K-12 systems. Trained on society's historical data and dominant narratives, AI threatens to automate and accelerate these patterns unless leaders act with care.[32]

Leaders must use this moment to confront existing (and potential) disparities in their systems by seeking out and dismantling inequitable structures, practices, and policies; engaging families and communities in shaping AI use; and empowering students as well as educators to become critical users of this new technology. All members of K-12 communities need to understand the limitations and biases of AI, can account for its disparate impacts, and ultimately challenge and transform the systems that previously produced inequitable outcomes. This shift is not about fixing AI's flaws, many of which are rooted in the data and power structures that shape its development. Instead, it's about changing how we build systems that equip communities to use AI as a lever for transformation. **When equity drives design, not just implementation, AI can help create learning environments that are more inclusive, liberatory, and just.**

[32] Benjamin, R. (2019). *Race after technology: Abolitionist tools for the new Jim code*. Polity Press.

Field Example: Expanding Equity Through Student Design

In St. Vrain Valley School District, students are not just using AI tools; they're building them. Through the district's Innovation Center, diverse student teams design and prototype AI-powered solutions to real-world problems. This hands-on approach positions students as creators, not just consumers, of technology, developing technical fluency while surfacing student voice, creativity, and lived experience. By expanding who gets to shape the future of AI, St. Vrain is demonstrating what it means to close equity gaps not just in access, but also in authorship.

Defining the Future with AI

The question facing K-12 education is not whether AI will shape the future of learning, but how. Today, schools and systems are caught between caution and urgency, navigating new tools without cohesive strategies or clear goals. This moment demands more than risk management or opportunistic adoption. It calls for thoughtful, community-informed approaches that align technology with the outcomes we care about most. To meet this challenge, we need policy that clarifies purpose and sets direction, not just limits; measurement systems that move beyond test scores to reflect what matters in real learning; and infrastructure that centers the expertise of educators and the voices of students.

AI will not, on its own, create better learning. However, if we act with clarity, care, and shared vision, it can become a powerful tool for advancing the human work of teaching and learning. The opportunity before us is not just to manage a new wave of technology, but to shape how that technology serves our educational goals.